

NOTES ON CERTAIN CRUCIFERAE

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SYNTHLIPSIS Gray

Pods oblong, strongly flattened contrary to the septum; valves sharply carinate, distinctly margined at the apex; areolae of septum not at all tortuous; ovules 6–12 in each cell; seeds with a mucilaginous testa whose cells emit spiral threads when wet.

S. Greggii Gray, Mem. Am. Acad. N. S. [Pl. Fendl.] 4 : 116. 1849.

Synthlipsis, as originally limited, remains monotypic and quite distinct from *Lesquerella* by reason of the carinate valves, the different septum, and the mucilaginous seed coat. Several other species have from time to time been referred to this genus because of their flattened pods. In all other ways, however, these agree with *Lesquerella* and in that genus they must be placed. One species seems even to have been described and maintained under two names—*S. Berlandieri* Gray and *Lesquerella lasiocarpa* (Hook.) Wats.

PHYSARIA Gray

A complete revision of this genus is in course of preparation, but until such time as that may be completed it was thought the following synopsis would be useful in the determination of exsiccatae.

KEY TO THE SPECIES AND VARIETIES

- A. Mature pods globose-inflated, not strongly flattened laterally.
 - a. Shoulders of upper sinus (of pods) rounded.
 - a. All the stems lateral; pods usually erect.
 - I. Basal leaves obtuse; blade usually circular in outline.
 - 1. Pods cordate at base.
 - * Basal leaves appressed-stellate.
 - † Pubescence of young pods spreading;
basal leaves angularly toothed.....1. *P. didymocarpa*
 - †† Pubescence of young pods appressed;
basal leaves entire or undulately toothed1a. var. *australis*
 - ** Basal leaves conspicuously lanate.....1b. var. *lanata*

- 2. Pods acute, obtuse or truncate at the base but scarcely cordate.
 - * Basal leaves fiddle-shaped; plants of Colorado 2. *P. vitulifera*
 - ** Basal leaves mostly entire; coarse plants of western Nebraska and the Dakotas 3. *P. brassicoides*
- II. Basal leaves acute; blade lanceolate in outline.
 - 1. Basal leaves mostly entire 4. *P. acutifolia*
 - 2. Basal leaves more or less pinnatifid 5. *P. floribunda*
 - a.* Terminal sterile sobs developing from the rosette; pods pendent 6. *P. Osterhoutii*
 - b.* Shoulders of the upper sinus angular, in young pods at least; pods furnished with keels along which the walls fold on drying 7. *P. Newberryi*
- B. Mature pods strongly flattened laterally.
 - a.* Pods obcordate in outline; replum about 5 mm. long.. 8. *P. Geyeri*
 - b.* Pods obreniform or broadly elliptical in outline; replum much longer.
 - a.* Style 1-2 mm. long; base of pods obtuse or truncate 9. *P. oregona*
 - b.* Style about 5 mm. long; base of pods cordate.... 10. *P. alpestris*

1. ***P. didymocarpa* (Hook.) Gray** in Wats. Bot. King's Exp. 20. 1871.

This species in its typical form is predominantly northern, occurring in the mountains from southern Canada to Wyoming and northern Utah.

1a. Var. *australis*, n. var.¹

Basal leaves entire or undulately toothed; pubescence of leaves and young pods closely appressed.

Distribution: this variety replaces the typical form in southern Wyoming, Colorado, northern New Mexico, and in parts of Utah.

Specimens examined:

Wyoming: Sand Creek, Albany Co., June 1, 1900, *A. Nelson* 7026 (Mo. Bot. Gard. Herb. and Rky. Mt. Herb.); dry white hills, Dyer's Ranch, Carbon Co., June 21, 1901, *Goodding* 80 (Mo. Bot. Gard. Herb. and Rky. Mt. Herb.); Cokeville, June 11, 1898, *A. Nelson* 4637 (Rky. Mt. Herb.); Ft. Bridger, June 9, 1898, *A. Nelson* 4602 (Rky. Mt. Herb.); Granger, June 13, 1898, *A. Nelson* 4688 (Rky. Mt. Herb.); Green River, May 30, 1897, *A. Nelson* 3032 (Rky. Mt. Herb.);

¹ ***Physaria didymocarpa* (Hook.) Gray, var. *australis*, var. nov.,** foliis radicalibus integris vel sinuato-dentatis; siliquis junioribus adpresso pubescentibus.—Collected on gravel washes, Placerville, Colorado, July 23, 1917, *Payson* 1093 (Mo. Bot. Gard. Herb.), TYPE.

Ft. Steele, June 18, 1898, *A. Nelson* 4834 (Rky. Mt. Herb.); Green River, July 9, 1897, *Williams* (Rky. Mt. Herb.); Bates Creek, July 5, 1901, *Goodding* (Rky. Mt. Herb.).

Colorado: dry hills, Naturita, April 22, 1914, *Payson* 247 (Mo. Bot. Gard. Herb. and Rky. Mt. Herb.); foothills near Mancos, June 23, 1898, *Baker, Earle & Tracy* 75 (Mo. Bot. Gard. Herb. and Rky. Mt. Herb.); Mack, May 27, 1908, *Jones* (Mo. Bot. Gard. Herb.); gravel washes, Placerville, July 23, 1917, *Payson* 1093 (Mo. Bot. Gard. Herb. and Rky. Mt. Herb.), TYPE; dry, rocky slopes, Paradox, June 13, 1912, *Walker* 89 (Rky. Mt. Herb.); Mesa Verde National Park, 1913, *Haas* 40 (Rky. Mt. Herb.); hills near Montrose, May 3, 1913, *Payson* 75 (Rky. Mt. Herb.).

New Mexico: Aztec, April, 1899, *Baker* 356 (Rky. Mt. Herb.).

Utah: gravel, Cedar City, May 8, 1894, *Jones* 5202 (Mo. Bot. Gard. Herb.); near Fish Lake, May 17, 1875, *Ward* 48 (Mo. Bot. Gard. Herb.); east slope, Steptoe Valley, May 13, 1859, *H. Engelmann* (Mo. Bot. Gard. Herb.); Echo, May 7, 1890, *Jones* (Mo. Bot. Gard. Herb.); Mt. Nebo, Aug. 15, 1905, *Ryberg & Carlton* 7740 (Rky. Mt. Herb.); shale slopes, Brush Creek Canyon, Uintah Mts., July 17, 1902, *Goodding* 1279 (Rky. Mt. Herb.).

1b. Var. *lanata* A. Nels. Bull. Torr. Bot. Club **31** : 241. 1904.

P. lanata Rydb. Bull. Torr. Bot. Club **39** : 322. 1912.

Distribution: northern Wyoming and Montana.

2. **P. vitulifera** Rydb. Bull. Torr. Bot. Club **28** : 278. 1901.

P. didymocarpa Gray, Am. Jour. Sci. & Arts II. **33** : 243. 1862.

Distribution: in the mountains of Colorado.

3. **P. brassicoides** Rydb. Bull. Torr. Bot. Club **29** : 237. 1902.

Distribution: western Nebraska to southwestern North Dakota.

4. **P. acutifolia** Rydb. Bull. Torr. Bot. Club **28** : 279. 1901.

Distribution: in the mountains of Colorado.

5. **P. floribunda** Rydb. Bull. Torr. Bot. Club **28** : 279. 1901.
Distribution: in the mountains of Colorado.

6. **P. Osterhoutii**, n. sp.¹

Silvery stellate perennial from a simple or branched caudex; basal leaves small, blade lanceolate to hastate, usually acute, 5–10 mm. long, petiole 5–15 mm. long; caudine leaves from narrowly hastate or lanceolate to linear, 1–3.5 cm. long; caudex branches terminated by sterile, leafy siboles 1–4 cm. long; flowering stems lateral, decumbent-ascending, leafy, 8–12 cm. long; flowers yellow, conspicuous, fruiting inflorescence elongating; pedicels recurved, 1 cm. or more long; pods pendent, obovate, base truncate or obtuse, apex deeply emarginate, cells inflated, rather loosely stellate; styles slender, about 4 mm. long, stigma capitate.

Distribution: north central Colorado.

Specimen examined:

Colorado: Kremmling, Grand Co., June 22, 1907, *Osterhout* 3477 (Rky. Mt. Herb.), TYPE.

Named in honor of Mr. Geo. E. Osterhout, of Windsor, Colorado, who was the first to recognize its specific distinction from the other known species of *Physaria*.

7. **P. Newberryi** Gray, Ives' Rept. Colo. River, pt. 4, 6. 1861.

P. didymocarpa (Hook.) Gray, var. *Newberryi* Jones, Proc. Calif. Acad. Sci. II. **5** : 624. 1895.

Distribution: northeastern New Mexico, southern Utah, northern Arizona, and southern Nevada.

8. **P. Geyeri** (Hook.) Gray, Gen. Illustr. **1** : 162. 1848.

Distribution: eastern Washington to western Montana.

9. **P. oregona** Wats., Proc. Am. Acad. **17** : 363. 1882.

¹ *Physaria Osterhoutii*, sp. nov., planta perennis undique indumento argenteo-stellata; caudicis ramis adscendentibus in siboles foliosas steriles terminantibus; foliis radicalibus petiolatis (petiolis 5–15 mm. longis) plus minusve hastatis, laminis lanceolatis plerumque acutis; foliis caulinis similibus sed angustioribus 1–3.5 cm. longis; caulis foliosissimis 8–12 cm. longis; corolla flava; racemis remotifloris post anthesin; pedicellis fructiferis recurvatis circa 1 cm. longis; siliquis obovatis basi truncatis vel obtusis, apice valde emarginatis laxe stellato-pubescentibus; stylo circa 4 mm. longo.—Collected at Kremmling, Grand Co., Colorado, June 22, 1907, *Osterhout* 3477 (Rky. Mt. Herb.), TYPE.

Distribution: eastern Oregon.

10. *P. alpestris* Suksdorf, West Am. Scientist **15**: 58. 1906.

Distribution: south central Washington.

DITHYREA Harv.

This North American genus differs from the Mediterranean genus *Biscutella* in three conspicuous ways. *Dithyrea* has branched hairs, a stigma, the lobes of which extend over the middle of the carpels, and a replum of two distinct limbs which subtend a narrow, though evident, septum. *Biscutella*, on the other hand, exhibits unbranched hairs, a stigma, the lobes of which extend over the placentae, and a replum with fused limbs and obsolete septum. Although the two genera seem amply distinct, it appears impossible to accept Prantl's view that they belong in different sections of the family.

KEY TO SPECIES AND VARIETIES

- A. Calyx spreading; pubescence of pods branched or stellate.
 - a. Leaves thick, lanceolate to linear, densely pubescent.
 - a. Leaves narrowly lanceolate to linear; stems branching, not strict.....*1a. var. Griffithsii*
 - b. Leaves broadly lanceolate; stems inclined to be strict.
 - I. Leaves cuneate at the base.....*1. D. Wislizenii*
 - II. Leaves truncate at the base; stems strict.....*1b. var. Palmeri*
 - b. Leaves thin, ovate or oblong, sparingly pubescent..*2. D. membranacea*
- B. Calyx tubular; pubescence of pods of flattened unbranched cilia.
 - a. Style about 0.5 mm. long; mature pods 6–8 mm. broad.
 - a. Corolla dull white; inland plants.....*3. D. californica*
 - b. Corolla purplish; beach plants.....*3a. var. maritima*
 - b. Style nearly or quite 1 mm. long; mature pods 3–4 mm. broad ..*4. D. clinata*

1. *D. Wislizenii* Engelm. Wisliz. Tour N. Mexico, 95. 1848.

Distribution: western Texas, southern New Mexico, and adjacent Mexico.

D. Wislizenii in the aggregate exhibits within its large range three fairly distinct but more or less arbitrarily limited phases. Fortunately enough, the type was collected from near the geographical center of distribution and represents a form intermediate between the two varieties. The species in its typical form passes gradually on the east into the variety *Palmeri* and on the north and west into the

variety *Griffithsii*. Probably it is only in southern New Mexico and territory adjacent that the three phases are found together. Forms with glabrous pods occur occasionally throughout the species, and this character is in no way a specific one.

1a. Var. *Griffithsii* (Wooton & Standley), n. comb.

D. Griffithsii Wooton & Standley, Contr. U. S. Nat. Herb. 16 : 124. 1913.

Distribution: western Texas, New Mexico, Arizona, southern Utah, and southern Nevada.

1b. Var. *Palmeri*, n. var.¹

Pubescence very dense, almost velvety; stems about 5 dm. high, stout, branched upwards, branches strict, erect, leafy; caudine leaves thick, sessile or nearly so, ascending, lanceolate, 2-3.5 cm. long, entire or shallowly toothed, margins undulate.

Distribution: from southwestern Oklahoma, through northwestern Texas to southern New Mexico.

Specimens examined:

Oklahoma: Cimarron River, July 12, 1899, *White* 155 (Mo. Bot. Gard. Herb.); sand by creek, near Granite, Greer Co., June 17, 1913, *Stevens* 1036 (Mo. Bot. Gard. Herb.); Greer Co., July 18, 1901, *White* (Rky. Mt. Herb.); Red River Valley, July 12, 1903, *Duncan* 79 (Mo. Bot. Gard. Herb.); Woodward Co., June 28, 1900, *White* (Rky. Mt. Herb.).

Texas: saline sands, Estelline, June 1, 1902, *Reverchon* 2971 (Mo. Bot. Gard. Herb.); sandy ground near Colorado, June 9, 1900, *Eggert* (Mo. Bot. Gard. Herb.); salty sands, Colorado City, April, 1882, *Reverchon* (Mo. Bot. Gard. Herb.); sandy open ground, Big Spring, Howard Co., July 9, 1917, *Palmer* 12493 (Mo. Bot. Gard. Herb.), TYPE.

New Mexico: Arroyo Ranch, near Roswell, May, 1903, *Griffiths* 4266 (Mo. Bot. Gard. Herb.).

¹ *Dithyrea Wislizenii* Engelm., var. *Palmeri*, var. nov., robusta plerumque stricta circa 5 dm. alta superne ramosa, pube ramosa brevi velutina; ramis foliosissimis strictis; foliis caulinis sessilibus vel fere sessilibus non patentibus lanceolatis basi truncatis 2-3.5 cm. longis.—Collected on sandy open ground, Big Spring, Howard Co., Texas, July 9, 1917, *Palmer* 12493 (Mo. Bot. Gard. Herb.), TYPE.

This variety is named in honor of Mr. E. J. Palmer, from whose excellent Texan collections the type has been chosen.

2. *D. membranacea*, n. sp.¹

Annual or biennial, green, rather sparsely pubescent with loose imperfect stellae or branching hairs; stems several from the root, sparingly branched, slender, decumbent, 3–6 dm. long; caudine leaves thin, narrowed abruptly at the base into a slender petiole about 1 cm. long, blade 3–4 cm. long, 2.5–3 cm. broad, irregularly ovate or oblong in outline, toothed or undulately lobed, apex broad and rounded; basal leaves unknown; sepals spreading, purplish; petals white, orbicular to oblong, abruptly narrowed to a very short claw and then somewhat dilated to point of insertion, margin irregular; filaments scarcely broadened at base; fruiting inflorescence elongated, pedicels about 12 mm. long, slender, divergent; pods apparently yet immature, erect or ascending, pubescent with two quite distinct sizes of branched hairs, substipitate, reticulated, and apparently lacking the margin so conspicuous in *D. Wislizenii*, cells nearly orbicular, about 4 mm. in diameter, replum about as long; style scarcely 1 mm. long, stigma subcapitate, slightly elongated over the middle of the carpels.

Distribution: Tamaulipas, Mexico.

Specimen examined:

Mexico: vicinity of Victoria, Tamaulipas, alt. about 320 m., February 1–April 9, 1907, Dr. Edward Palmer 87 (Mo. Bot. Gard. Herb.), TYPE.

It is extremely interesting to find another species of *Dithyrea* very different from either of the two previously known. In general aspect it is much more like *D. californica* than *D. Wislizenii*, but in the characters of the flowers and fruit it is surely nearer the latter. The specific name was sug-

¹ *Dithyrea membranacea*, sp. nov., *D. Wislizenii* peraffinis sed caulis foliisque viridibus parce pubescentibus; caulis gracilibus decumbentibus 3–6 dm. longis; foliis caulinis membranaceis subovatis vel oblongo-ovatis circa 3–4 cm. longis 2.5–3 cm. latis plus minusve undulato-dentatis basi in petiolum circa 1 cm. longum abrupte attenuatis apice rotundatis; calycis lobis patentibus purpureo-tinctis; corolla alba; siliquis reticulatis non (?) marginatis.—Collected in the vicinity of Victoria, Tamaulipas, February 1–April 9, 1907, Palmer 87 (Mo. Bot. Gard. Herb.), TYPE.

gested by the thin leaves which are in such striking contrast to those of the other species.

3. *D. californica* Harv. in Hook. Lond. Jour. Bot. 4: 77, pl. 5. 1845.

Distribution: southern Nevada, western Arizona, southern California, and northern Lower California.

3a. Var. *maritima* Davidson in Gray, Syn. Fl. N. Am. 1¹: 123. 1895.

Distribution: "occasional along the seashore between Redondo and Port Ballona," southern California.

4. *D. clinata* Macbr. & Pays., n. sp.¹

Slender-stemmed annual or biennial less than 3 dm. high; stems few, erect except at the subdecumbent base, simple or branched once toward the summit, sparsely pubescent; leaves subcinereous with branched hairs; basal leaves somewhat lyrately subpinnatifid, about 4 cm. long including the slender petiole, 5–10 mm. broad; stem-leaves few, gradually reduced upward, subentire or undulately lobed, ovate-oblong, the middle caudine, 1–1.5 cm. long, about 5 mm. broad, the uppermost about 5 mm. long and about 2.5 mm. broad; inflorescence about 1 dm. long; pedicels in fruit more or less recurved; petals white (?), scarcely 10 mm. long, exceeding the purplish sepals by about 2.5 mm.; style nearly 1 mm. long; fruit similar to that of *D. californica* but rarely half as large.

Distribution: unknown.

Specimen examined:

Lower California: Lagoon Head, March 6–15, 1889, Dr. Edward Palmer 824 (Gray Herb.), TYPE.

Draba Standleyi Macbr. & Pays., nom. nov.

D. gilgiana Wooton & Standley, Contr. U. S. Nat. Herb. 16:

¹ ***Dithyrea clinata*** Macbr. & Pays., spec. nov., planta annua vel biennis circa 3 dm. alta; caulibus gracilibus simplicibus parce pubescentibus; pilis ramosis; foliis cinereo-pubescentibus, radicalibus lyrato-subpinnatifidis circa 4 cm. longis 5–10 mm. latis basi in petiolum circa 1.5 cm. longum abrupte attenuatis, caulinis superioribus paucis gradatim reductis ovato-oblongis plus minusve sinuato-dentatis; racemis circa 1 dm. longis; pedicellis fructiferis plus minusve recurvatis; corolla ut videtur alba vix 10 mm. longa calycem superante 2.5 mm.; stylo fere 1 mm. longo; fructu ut apud *D. californicam* sed solum 3–4 mm. lato. —Collected at Lagoon Head, Lower California, March 6–15, 1889, Palmer 824 (Gray Herb.), TYPE.

124. 1913, not *D. Gilgiana* Muschler in Fedde, Rep. Nov. Sp. 3 : 212. 1906.

The use by Muschler in 1906 of the name *Gilgiana* for a seemingly valid species of *Draba* in Asia Minor precludes the acceptance of this name for the distinctive, more recently published, New Mexican plant. Accordingly we have renamed the American species.